In The Claims:

1-25 (Cancelled)

26. (New) A method of making an optical waveguide, comprising:

providing a substrate comprising a semiconductor layer having an upper surface;

forming an opening through the upper surface of the semiconductor layer;

depositing a bottom cladding layer on the upper surface of the semiconductor layer and conformally within in the opening;

depositing a core material to fill the opening;

removing excess core material without removing the bottom cladding layer; and

depositing a top cladding layer over the core material.

27. (New) The method of claim 26, wherein the semiconductor layer comprises at least one material selected from the group consisting of silicon, silicon-germanium, gallium arsenide, indium gallium arsenide and indium phosphide.

28. (New) The method of claim 26, wherein the semiconductor layer is silicon.

29. (New) The method of claim 26, wherein the bottom cladding layer and the top cladding layer are formed from silicon oxide, each layer having a different refractive index.

30. (New) The method of claim 26, wherein excess core material is removed by chemical mechanical polishing.

31. (New) The method of claim 26, wherein the upper cladding layer comprises silicon oxide.

32. (New) The method of claim 26, wherein the upper cladding layer comprises glass.

33. (New) The method of claim 26, wherein the bottom cladding layer comprises silicon oxide.

34. (New) The method of claim 26, wherein the bottom cladding layer comprises glass.

35. (New) A method of making an optical waveguide, comprising:

providing a substrate comprising a semiconductor layer disposed on a first insulating layer;

forming an opening through an upper surface of the semiconductor layer to expose a portion of the first insulating layer;

depositing a bottom cladding layer on the upper surface of the semiconductor layer and conformally within in the opening;

depositing a core material to fill the opening;

removing excess core material without removing the bottom cladding layer; and

depositing a top cladding layer over the core material.

36. (New) The method of claim 35, wherein the first insulating layer comprises silicon oxide.

37. (New) The method of claim 35, wherein the substrate further comprises:

a second insulating layer having the first insulating layer disposed thereon.

38. (New) The method of claim 37, wherein the second insulating layer and the first insulating layer are comprised of the same material.

39. (New) The method of claim 37, wherein the second insulating layer comprises silicon oxide.

40. (New) The method of claim 37, wherein the second insulating layer comprises glass.

41. (New) The method of claim 35, wherein the semiconductor layer comprises at least one material selected from the group consisting of silicon, silicon-germanium, gallium arsenide, indium gallium arsenide and indium phosphide.

42. (New) The method of claim 35, wherein the bottom cladding layer and the top cladding layer are formed from silicon oxide, each layer having a different refractive index.

43. (New) The method of claim 35, wherein excess core material is removed by chemical mechanical polishing.

44. (New) The method of claim 35, wherein the upper cladding layer comprises silicon oxide.

45. (New) The method of claim 35, wherein the upper cladding layer comprises glass.

46. (New) The method of claim 35, wherein the bottom cladding layer comprises silicon oxide.

47. (New) The method of claim 35, wherein the bottom cladding layer comprises glass.

48. (New) A method of making an optical waveguide, comprising:

providing a substrate comprising a semiconductor layer, a first insulating layer, and a second insulating layer, the semiconductor layer disposed on the first insulating layer and the first insulating layer disposed on the second insulating layer;

forming an opening through an upper surface of the semiconductor layer to expose a portion of the first insulating layer;

depositing a bottom cladding layer on the upper surface of the semiconductor layer and conformally within the opening;

depositing a core material to fill the opening;

removing excess core material without removing the bottom cladding layer; and

depositing a top cladding layer over the core material.

49. (New) The method of claim 48, wherein the second insulating layer and the first insulating layer are comprised of the same material